a power source for generating a plasma of said dopant gas and said second gas;

an extraction electrode for extracting ions of said dopant gas and said second gas;

a magnet for separating the extracted ions on a mass basis;

a slit for cutting a first portion of said ions separated by said magnet while allowing a second portion of said ions to pass through said slit;

a substrate holder for holding a substrate, wherein said substrate is subjected to a flow of said second portion of said ions wherein said flow of the second portion of said ions has a cross section at said substrate, said cross section being elongated in one direction, and

a moving means for moving said substrate in an orthogonal direction to the elongation direction of said cross section.

7.(Amended) An ion doping apparatus comprising:

an ion source containing ions of a dopant gas;

an extraction electrode for extracting the ions of said dopant gas;

a magnet for producing a magnetic field to separate the extracted ions on a mass basis;

an acceleration electrode for accelerating the extracted ions toward a substrate so that said substrate is irradiated

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with a beam of said ions wherein said beam has an elongated cross section at said substrate;

a substrate holder for holding said substrate; and

a means for moving said substrate in an orthogonal direction to the elongation direction of said elongated cross section,

wherein said magnet is located between said extraction electrode and said acceleration electrode.

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10. (Amended) An ion doping apparatus comprising:

an ion source containing ions of a dopant gas;

an extraction electrode for extracting the ions of said dopant gas to form a flow of ions of the dopant gas;

an acceleration electrode for accelerating the flow of the ions of the dopant gas toward a substrate;

a substrate holder for holding said substrate; and

coils located between said extraction electrode and said acceleration electrode to shape a cross section of said flow into a line shape wherein said cross section is taken along a plane perpendicular to the flow, and wherein a diameter of said coils is monotonically decreased as the flow of said ions extends downstream; and

a means for moving said substrate in an orthogonal direction to an elongation direction of said line shaped cross section.

12.(Amended) An apparatus comprising:

a gas source for introducing a dopant gas and a second gas for diluting said dopant gas into a chamber;

a power source for generating a plasma of said dopant gas and said second gas;

an extraction electrode for extracting ions of said dopant gas and said second gas;

a magnet for separating the extracted ions on a mass basis;

a slit for cutting a first portion of said ions separated by said magnet while allowing a second portion of said ions to pass through said slit;

a substrate holder for holding a substrate, wherein said substrate is subjected to a flow of said second portion of said ions wherein said flow of the second portion of said ions has a cross section at said substrate, said cross section being elongated in one direction; and

a laser irradiation means for irradiating said substrate with a laser beam while moving said substrate in a direction orthogonal to an elongated cross section of said laser beam after said substrate is subjected to said flow of said ions.

18.(Amended) An apparatus comprising:

an ion source containing ions of a dopant gas;

an extraction electrode for extracting the ions of said dopant gas;

a magnet for producing a magnetic field to separate the extracted ions on a mass basis;

an acceleration electrode for accelerating the extracted ions toward a substrate so that said substrate is irradiated with a beam of said ions wherein said beam has an elongated cross section at said substrate; and

a laser irradiation means for irradiating said substrate with a laser beam while moving said substrate in a direction orthogonal to an elongated cross section of said laser beam after said substrate is irradiated with said beam of said ions,

wherein said magnet is located between said extraction electrode and said acceleration electrode.

Please add new claims 21-37.

--21.(New) An ion doping apparatus comprising:

a means for generating an ion current having an elongated cross section;

a means for applying a first magnetic filed to focus said ion current;

a means for applying a second magnetic filed to said ion current in a direction substantially parallel with said elongated cross section of said ion current;

a slit for cutting a portion of said ion current; and

a stage which moves in a direction substantially perpendicular to said elongated cross section of said ion current.

22. (New) An ion doping apparatus according to claim 21, further comprising a means for irradiating a laser beam having an elongated cross section.

23. (New) An ion doping apparatus according to claim 21, wherein said first magnetic field is generated by coils.

24. (New) An ion doping apparatus according to claim 21, wherein said second magnetic field has a strength between 0.1 to 10 tesla.

25. (New) An ion doping apparatus comprising:

a means for generating an ion current having an elongated cross section;

a means for applying a first magnetic filed to focus said ion current;

a means for accelerating said ion current focused by said first magnetic field;

a means for applying a second magnetic filed to said ion current in a direction substantially parallel with said elongated cross section of said ion current; and

a stage which moves in a direction substantially perpendicular to said elongated cross section of said ion current.

26. (New) An ion doping apparatus according to claim 25, further comprising a means for irradiating a laser beam having an elongated cross section.

27. (New) An ion doping apparatus according to claim 25, wherein said first magnetic field is generated by coils.

28. (New) An ion doping apparatus according to claim 25, wherein said second magnetic field has a strength between 0.1 to 10 tesla.

29. (New) An ion doping apparatus comprising:

a means for generating an ion current having an elongated cross section;

a means for generating a magnetic field for separating said ion current on a mass basis;

an acceleration electrode for accelerating said ion current separated on said mass basis, wherein a portion of said ion current passes through said acceleration electrode; and

a stage which moves in a direction substantially perpendicular to said elongated cross section of said ion current.

30. (New) An ion doping apparatus according to claim 29, further comprising a means for irradiating a laser beam having an elongated cross section.

31. (New) An ion doping apparatus according to claim 29, wherein said magnetic field has a strength between 0.1 to 10 tesla.

32. (New) An ion doping apparatus comprising:

a means for generating an ion current having an elongated cross section;

a means for separating said ion current into at least two ion currents;

a means for accelerating one of said two ion currents, wherein another one of said two ion currents is not accelerated by said accelerating means; and

a stage which moves in a direction substantially perpendicular to said elongated cross section of said ion current.

33. (New) An ion doping apparatus according to claim 32, further comprising a means for irradiating a laser beam having an elongated cross section.

34. (New) An ion doping apparatus according to claim 32, wherein said magnetic field has a strength between 0.1 to 10 tesla.

35. (New) An ion doping apparatus comprising:

a means for generating an ion current having an elongated cross section;

a means for applying a magnetic filed to said ion current in a direction substantially parallel with said elongated cross section of said ion current; and

a means for accelerating a specified ion contained in said ion current.

36. (New) An ion doping apparatus according to claim 35, further comprising a means for irradiating a laser beam having an elongated cross section.

37. (New) An ion doping apparatus according to claim 35, wherein said magnetic field has a strength between 0.1 to 10 tesla.--